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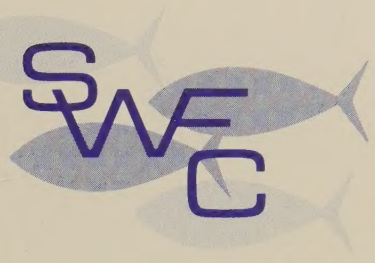

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SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - MARCH 1983
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MONTHLY REPORT - MARCH 1983

STATUS OF PUBLICATIONS

Published

Ralston, Stephen, and Garrett T. Miyamoto. 1981. Estimation of the age of a tropical reef fish using the density of daily growth increments. In: Edgardo D. Gomez, Charles E. Birkeland, R.W. Buddemeier, R.E. Johannes, J.A. Marsh, Jr., and R.T. Tsuda (eds.), The reef and man, pp. 83-88. Proceedings of the Fourth International Coral Reef Symposium, Vol. 1. Mar. Sci. Cent., Univ. Philippines, Quezon City.

Daily growth increments found in the otoliths of Pristipomoides filamentosus (Pisces:Lutjanidae) were used to estimate the ages of the larger and older individuals which are harvested in the commercial deep-sea handline fishery in Hawaii. Previous investigations have been limited to visual counts of all rings present in an otolith, precluding the possibility of ageing large fish. A method was devised in which the density of increments within an otolith is related to fish size and age is estimated by regression statistics.

To date 81 otoliths have been analyzed from fish ranging in size from 18 to 70 cm fork length. Sagittae were read from the focus to the antirostral margin of the otolith in frontal sections. Numerous determinations of the density of daily increments were made at measured distances from the focus by microscopic examination and statistical regressions were performed on these data. Integration of the regression equation, bounded by the focus and the otolith margin, provides an estimate of the age in days of the sample specimen. Independent size-frequency data confirm the daily periodicity of the increments.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Overall, approximately 77% of the variation in increment density was explained by the linear model. Error estimates of age were obtained by the Delta Method, a propagation of error technique. In general, the coefficient of variation for age estimates is about 6%, indicating an acceptable level of precision. This new method of obtaining age estimates may prove valuable in the management of tropical fish stocks if assumptions concerning growth interruptions and increment periodicity can be satisfied.

Translation

Ichikawa, Wataru. 1982. Results of experiments using a low temperature live-bait tank system in the skipjack tuna pole-and-line fishery (Katsuo-tsuri gyogyo ni okeru teion katsu-e sochi shiken no kekka). JAMARC (Jpn. Mar. Fish. Resour. Res. Cent.) 23:33-41. (Engl. transl. by Tamio Otsu, 1983, 12 p., Transl. No. 78; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Administrative Reports

Honolulu Laboratory

Hendrix, Sharon D. 1982. Factors affecting the growth and survival of skipjack tuna, Katsuwonus pelamis, larvae reared in the laboratory. SWFC Admin. Rep. H-82-23C.

Hendrix, Sharon D. 1983. The early life history of mahimahi (Coryphaena hippurus and C. equiselis) and skipjack tuna (Katsuwonus pelamis): A report on the culture and growth of larval fish reared in the laboratory. SWFC Admin. Rep. H-83-2C.

Polovina, Jeffrey J. 1983. A statistical sampling guide to inspect dockside landings for adherence to the regulations in the Fishery Management Plan for spiny lobsters. SWFC Admin. Rep. H-83-3.

U.S. National Marine Fisheries Service. 1983. The 1976-78 studies of the Kailua-Kona, Hawaii, billfish fishery. Part II, charter boat operators component. SWFC Admin. Rep. H-83-4.

U.S. National Marine Fisheries Service. 1983. The 1976-78 studies of the Kailua-Kona, Hawaii, billfish fishery. Part III, charter boat patrons component. SWFC Admin. Rep. H-83-5.

BT and Associates. 1983. Recent trends in the Hawaii markets for mahimahi and ono. SWFC Admin. Rep. H-83-6C.

Approved by Center Director

Bagarinao, Teodora and John R. Hunter. The visual feeding threshold and action spectrum of northern anchovy (Engraulis mordax) larvae and some ecological implications. For consideration for publication in the Canadian Journal of Fisheries and Aquatic Sciences.

Coe, James M., David B. Holts and Richard W. Butler. Guidelines for the prevention of porpoise mortality in tuna purse seining. For consideration for publication as a NOAA Technical Report, NMFS Circular.

Gerrodette, Tim. Detecting trends in abundance. For consideration for publication in the Journal of Wildlife Management.

Kaya, Calvin M., Martina K.K. Queenth, and Andrew Dizon. A capturing and restraining technique for the gonadal biopsy, injection, and marking of small tuna in laboratory holding tanks. Progressive Fish-Culturist.

Klevezal, G.A. and A.C. Myrick, Jr. Marks in tooth dentine of female dolphins (genus Stenella) as indicators of parturition. For consideration for publication in the Journal of Mammalogy.

Lynn, Ronald. Aspects of physical oceanography as they relate to the migration of fish. For the Proceedings of NATO Advanced Research Fish Migration Workshop, Acquafredda, Italy - December 1982.

Shomura, Richard S. A note on tuna research activity in the U.S.A. Proceedings, Japan Tuna Fishery Research Conference, Shimizu, Japan, 3-4 February 1983.

Walker, Michael M. Magnetic sensitivity and its possible physical basis in the yellowfin tuna, Thunnus albacares. Proceedings of NATO Advanced Research Institute, "Mechanisms of Migration of Fishes."

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

Manuscripts Under Preparation for NWHI Symposium

Richard N. Uchida, Leader of the Insular Ecosystem Program, reports that researchers in the program are preparing manuscripts for presentation at the second Northwestern Hawaiian Islands (NWHI) symposium. Work is in progress on the following manuscripts: "Biology, distribution, population structure, and pre-exploitation abundance of spiny lobster, Panulirus marginatus (Quoy and Gaimard 1825), in the Northwestern Hawaiian Islands" by Uchida and research assistant Darryl T. Tagami; "The food and feeding habits of the white trevally, Pseudocaranx dentex (Block and Schneider 1801), in the Northwestern Hawaiian Islands" and "The food and feeding habits of the sea bass, Epinehelus quernus Seale, in the Northwestern Hawaiian Islands" by research assistant Michael P. Seki; "Seamount fishery resources in the Northwestern Hawaiian Islands" by research assistant Robert L. Humphreys, Jr.; "Distribution and relative abundance of caridean shrimps in the Northwestern Hawaiian Islands" by Reginald M. Gooding, Fishery Biologist; "Distribution, apparent abundance, and an overview of life history research on the bottom fish species in the Northwestern Hawaiian Islands" by James H. Uchiyama, Fishery Biologist, and Tagami; and "Length-weight and standard length-fork length relationships of deep-sea handline fishes of the Northwestern Hawaiian Islands" by Uchiyama, Sally Kuba, Computer Programmer, and Tagami.

In relation to the study of the bottom fishes, Uchiyama reports that the apparent abundance of the eight most important bottom fish species were examined at separate banks. The opakapaka, Pristipomoides filamentosus, was the dominant species at Necker Bank, French Frigate Shoals, and Brooks Banks, and comprised 40-55% of the catch by number at these banks. Ehu, Etelis carbunculus, was the dominant species west of Lisianski Bank and comprised 45-86% of the catch by number at some of the pristine banks. The size of fish caught was generally greater at the northwest end of the NWHI.

PELAGIC RESOURCES INVESTIGATION

Various Experiments Continuing at the Kewalo Research Facility

Dr. Richard W. Brill, Leader of the Experimental Ecology of Tunas Program, reports that Sharon D. Hendrix, University of Hawaii (UH) graduate student, has been analyzing otoliths taken from larval and juvenile mahimahi that were reared at the Kewalo Research Facility to see if differences in growth rates of the larval and juvenile fish are reflected in their otoliths. In addition, Thomas K. Kazama, Fishery Biologist, Dr. Gordon Grau, UH

Department of Zoology, and Brill ran an initial experiment to test the effects of thyroxine on growth rates of larval mahimahi. Fish exposed to thyroxine did show some increased growth in comparison to controls. Additional experiments will be conducted as soon as more mahimahi eggs can be obtained.

Michael M. Walker, UH graduate student, has been continuing his work to identify nerves innervating the suspected magnetic receptor organ in tunas histologically. Research assistant Martina K.K. Queenth is continuing her experiments using behavioral tests to determine if mahimahi and kawakawa can also detect changes in the Earth's magnetic field as yellowfin tuna have been shown to be able to do.

Brill has been conducting a series of experiments to measure the standard metabolic rate, i.e., the metabolic rate at zero overt muscular activity, of kawakawa. Results so far show that the standard metabolic rate of kawakawa is not significantly different from that of skipjack tuna. Additional experiments have shown that, unlike active metabolic rate, the standard metabolic rate of kawakawa is highly temperature sensitive.

Tagging Mortality of Skipjack Tuna Studied

Dr. Robert E. Kearney, South Pacific Commission, in cooperation with fishery biologist Dr. Jerry A. Wetherall and several members of the Experimental Ecology of Tunas Program, conducted an experiment to measure the mortality caused by tagging skipjack tuna. This project was designed specifically to complement the SPC skipjack tuna tagging project in the South Pacific. Results so far show that the tagging induces no increase in mortality.

FISHERY MANAGEMENT RESEARCH PROGRAM

Spiny Lobster Regulations Go Into Effect

Dr. Robert A. Skillman, Leader of the Fishery Management Research Program (FMRP) reports that the regulations relating to the fishery management plan for the spiny lobster fisheries of the western Pacific went into effect on 9 March 1983. Ray F. Sumida, Fishery Biologist, and Skillman developed a draft of procedures to handle the logbook and trip report data forms that are required for submission to the Director, Southwest Region (SWR). The data management system includes all steps from receiving the data forms from SWR to issuing monthly reports on the fishery to the SWR Director.

Progress Reported on Several Socio-Economic Studies

Samuel G. Pooley, Industry Economist, reports progress on several socio-economic contract studies. First, a final report describing the marketing of mahimahi and wahoo (ono) in Hawaii was received from the contractor. Second,

regarding the survey of costs and earnings of deep-sea handline and tuna longline vessels in Hawaii, the contractor has delivered the data on magnetic tape and is now starting on the second phase of the contract which involves developing an economic model of these fisheries. Third, the fielding format for the experimental valuation of recreational fishing has been developed and the contractor is expected to field the study this month.

A document describing the Fishery Management Research Program's (FMRP) socio-economic research plans will be issued shortly as an Administrative Report. The document presents information on the goals, objectives, and proposed activities of FMRP research in economics and relates these plans to needs with respect to fishery management plans and general monitoring of fisheries in the region.

Billfish Data Base Updated

Thomas S. Hida, Fishery Biologist, reports that the data bases on the Hawaiian Billfish Tournament and the Hawaiian International Billfish Tournament have now been updated to include data for 1978-82. Data extracted from the newspaper, Hawaii Fishing News, for 1979, 1980, and 1982 are now being verified. These data will be summarized for inclusion in a report being prepared on recreational fishing for the Western Pacific Regional Fishery Management Council (Council) meeting in May. Hida also reports that operators of two charter boats in Hawaii requested assistance in obtaining logbooks patterned after those used by the Air Force's Mele Moku. As reported previously, the detailed catch and operational logbooks of the Mele Moku have been provided to the staff, and summaries on catch and catch per unit of effort trends are being prepared for inclusion in a report being prepared for presentation at the May Council meeting. In response to this request, logbooks were provided to the Navy charter boat, Mokunani, and a commercial charter boat, the Kono. In return, copies of the completed logsheets will be submitted to the Honolulu Laboratory.

* * * * * * * * * *

Research assistants Bert S. Kikkawa and Bernard M. Ito obtained estimates of the 1982 Hawaii landings of skipjack tuna and albacore (the latter only for offshore trollers). These estimates will be submitted to the Western Pacific Program Office, Southwest Region, for inclusion in the Fishery Statistics of the U.S.

Hawaii Skipjack Tuna Landings Continue Below Average

The March 1983, Hawaii landings of skipjack tuna were estimated at 30 metric tons (MT), which is 22 MT below the March 1982 landings and 96 MT below the 1964-80 long-term average for March. The cumulative landings from January through March were estimated at 104 MT, which is 39 MT below the 1982 landings

for the same period and 280 MT below the 1964-80 long-term average for the same period.

Computer Processing Contract to be Terminated

Computer systems analyst David Hamm reports that the contract for word and data processing on the East-West Center's DEC system, which was extended for a month, will be terminated at the end of March. The Honolulu Laboratory will keep the six terminals and two printers which were being used on a lease-purchase agreement. This equipment will be used on the supermicrocomputer that is being purchased.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

COASTAL EASTERN PACIFIC FISHERIES ENVIRONMENTAL INVESTIGATIONS

SWFC Scientists Participate in El Niño Workshop at Scripps

Oceanographers Ron Lynn and Ken Bliss and Professor Joe Reid of Scripps Institution of Oceanography this month presented a poster at a workshop on the 1982-83 El Niño sponsored by the California Space Institute of the University of California, and held at the Scripps Institution of Oceanography. The El Niño, a phenomenon that may occur once or twice in a decade, is characterized by marked changes in wind and strength of ocean circulation that cause extensive warming of the ocean in the Pacific tropics and in regions along the coasts of North and South America. The warming and shifts in water masses are accompanied by changes in the biology and fisheries.

The El Niño conditions which began to develop in the latter half of 1982 appear to be the most extreme recorded in modern times.

Lynn, Bliss, and Reid reported on the oceanographic effects of the El Niño in the California Current. Oceanographic data for this analysis were collected aboard the NOAA research vessel Townsend Cromwell (fishery biologists Dr. Paul Smith and William Flerx, Cruise Leaders) in a transect from Honolulu to San Diego and in the following CalCOFI survey. Lynn et al. found that conditions related to the California coastal countercurrent to be the most extreme in the 33-year history of CalCOFI. The Countercurrent is strong and wide, no indications of upwelling were found and temperatures were 3 to 4°C higher than seasonal norms, particularly at depths between 50 and 150 meters. The thermocline near the coast had deepened by 20 to 30 meters. Workshop participants reported that the anomalous conditions that characterize the El Niño event, which in former episodes retract in February and March, are continuing unabated. This evidence was cited in predicting that this El Niño may extend into the winter of 1983-84.

Dr. Paul Fiedler, Physical Science Technician, presented a poster at the El Niño workshop which demonstrated the effects of the El Niño in waters off central and southern California as derived from satellite thermal imagery. Ocean temperatures on April 1 were 1 to 3°C higher than on April 23, 1982. Since December 1982, images covering the Southern California Bight have shown reduced upwelling off Pt. Conception. The mass of cold water which normally extends south and covers the northwestern sector of the Bight has been absent this winter. As a result, the entire Bight has been relatively warm. The 1983 CalCOFI anchovy egg and larval survey revealed that northern anchovy are spawning much farther to the north and offshore than in the 3 previous years.

Workshops Held for Albacore Fishermen

Oceanographer Dr. Michael Laurs this month participated in a series of albacore workshops sponsored by the California Sea Grant Marine Advisory Program. Laurs gave lectures at ports between Crescent City and San Diego, California, which drew an audience of about 300 fishermen. Laurs' presentation dealt with 1) albacore migration patterns, 2) results from exploratory longlinging for albacore, 3) vertical distribution and small-scale movements of albacore based on acoustic telemetry studies, 4) satellite applications to fisheries, and 5) review of current El Niño conditions and warm water anomalies off the west coast of North America.

In addition to Laurs, representatives from the California Department of Fish and Game and from the University of California at Davis discussed direct marketing of albacore.

Laurs also participated in a satellite oceanography meeting on March 22 and 23 in Washington, DC. The purpose of the meeting was to review current ocean satellite data applications and to plan a strategy for future NOAA involvement in ocean remote sensing activities. The meeting was chaired by Dr. Eric Schneider, Special Assistant to NOAA Administrator John Byrne, who has been directed to prepare a budget enhancement proposal for FY 1985 for satellite oceanography.

ECOLOGY AND TAXONOMY OF FISHES

Update on Plans for Ahlstrom Memorial Symposium

Dr. Geoffrey Moser, Fishery Biologist, met with other steering committee members at the Miami, Florida, Laboratory this month to facilitate plans for the upcoming Ahlstrom Memorial Symposium on the Ontogeny and Systematics of Fishes, to be held at the University of California, San Diego, August 15-18. A total of 32 manuscripts was reviewed by the committee. The group met with Dr. C.R. Robins, President of the American Society of Icthyologists and Herpetologists, and discussed the publication of the symposium volume under ASIH sponsorship.

The upcoming program will begin with two major papers, one reviewing the interrelationships of early life history studies, systematics and fisheries and the other assessing the role of ontogenetic characters in fish systematics. Following this will be a paper defining ontogenetic stages of fishes and an extensive poster session addressing techniques and approaches used in this field. Three days will be devoted to a systematic review of major fish groups, with particular attention to ontogenetic characters and their utility in assessing phylogenetic relationships. A major summary paper will conclude the symposium. A total of 79 papers, presented by 74 invited speakers, will form the basis for the symposium volume.

COASTAL EASTERN PACIFIC POPULATION BIOLOGY OF FISHES

Plankton Analysis Completed

Dr. Angeles Alvariño, Fishery Biologist, reports that analyses of all planktic organisms taken in CALVET samples collected in February 1982 and April 1980 have been completed. These studies include the species identification of all the plankton groups appearing in the sample, counting of specimens per species, number of males and females, recording of stages of development, number of mature specimens, identification of larval stages and number of eggs. These analyses will provide further needed information on the biotic characteristics of the regions selected by northern anchovy, Engraulis mordax, for spawning, and the variations in number and composition of the plankton community according to time and year.

Alvariño also devoted time this month to the analyses of 58 plankton samples from the Antarctic to obtain additional specimens of the newly discovered species of Siphonophorae from that region. She has discovered three new species and new forms of well-known species; these data are presented in two manuscripts, approved for publication under the titles, "Three new species of Lensia, and description of the eudoxid stage of Lensia reticulata and Lensia Telouveteau (Calycophorae, Siphonophorae)" and "Two new Clausophyidae (Calycophorae, Siphonophorae) from the Antarctic."

Plankton Microstructure Analysis Underway

Work initiated by oceanographer Dr. Bob Owen to determine the likelihood that fish larvae encounter food concentrated in patches too small to be detected by conventional sampling is now at the stage of comprehensive statistical analysis and description. With advice by mathematician Dr. Nancy Lo and with help from biological aid Lee Innes-Brown and programmer Barry Finzel, Owen has determined coefficients for fine- and microscale patchiness for larval fish foods and other small plankton, and for associated environmental factors such as nutrient salts, phytopigments, temperature and particulates.

Work is presently centered on analysis of sampling errors and on testing consistencies and relationships among these variations, derived from samples taken at 20 cm intervals in the ocean's mixed and stratified layers, to infer biological and physical factors involved in the creation and maintenance of small-scale patchiness. The group is also testing the predictability of incidence of microstructure from easily monitored parameters so that this condition for survival of fish larvae can be cheaply specified.

The main preliminary finding is that microstructure of small plankton is commonplace in the larval anchovy environment - somewhat more pronounced in physically stable layers but detectable in the upper mixed layer as well. At this stage of the analysis, no strong relationship has emerged between microstructure of nutrients and autotrophic organism concentration, hence the

group does not think that mobile phytoplankton actively seek small patches of nutrients. Also, few cases have shown strong relationships between particle concentrations and plankton concentrations, indicating that most of the articles (as sensed by Coulter counting) are detrital rather than plankton organisms, and that most plankton populations are unresponsive or slow to respond to varying detrital concentrations.

Computer Readied for Otolith Counts

Fishery biologists John Butler and Rick Methot this month completed translating computer programs used for counting growth increments on fish otoliths (a small bone of the ear), from Mecca Basic to c Basic. The otolith microcomputer is now fully operational, with programs to collect data and calculate age, birthdate, and growth history. Data can be transferred from the micro to the VAX system for further analysis.

Butler and biologist Susan Longinotti have begun analysis of the 1982 anchovy recruits. Butler has also calculated birthdates for pinhead anchovies (4-6 cm) collected during the March biomass cruise of the NOAA research vessel, Townsend Cromwell. The occurrence of such small fish was an unusual event, since typically the smallest anchovy are 8-9 cm long. The 50-60 mm fish taken by the Cromwell in March were spawned in October of 1982; growth rates during the winter were similar to those of 50-60mm fish taken in the fall of 1981. This indicates that a significant fall spawning of anchovy may have occurred in the fall of 1981.

Bering Sea Meeting Held

Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division, and Scripps Institution of Oceanography graduate student Liz Clarke, attended a meeting of PROBES - Processes and Resources of the Bering Sea - held in Honolulu this month. Dr. Lasker presided over a session on inter- and intra-annual variability of oceanography and carbon flux. Clarke presented details of her thesis work on food and feeding of pollock larvae in the Bering Sea as related to food concentration.

COMMERCIAL AND RECREATIONAL FISHERIES RESOURCES FOR MANAGEMENT

Pelican Reproduction Related to Anchovy Biomass

On March 16 fishery biologists Richard Methot and Alec MacCall, Co-chairmen of the Anchovy Plan Development Team, met with Dan Anderson, University of California, Davis, Frank Gress (UC Davis), Tim Gerrodette, Southwest Fisheries Center, Dave Harlow, U.S. Fish and Wildlife Service (USFWS), and Gail Kobetich (USFWS) to discuss the revised anchovy Fishery Management Plan (FMP) and its potential impacts on the brown pelican, an endangered species. Because anchovy is the major prey of brown pelicans, it

is important to consider the impact of a change in anchovy management on the availability of forage for pelicans. This meeting was in preparation for formal Section 7 consultations required by the Endangered Species Protection Act.

After discussing the general features of the revised FMP, the new time series of anchovy spawning biomass (B) based on egg production was compared to data on reproductive success of pelicans (R) as measured by the number of fledglings per nesting pair at Anacapa and Los Coronados Is. A highly significant nonlinear relationship was noted:

$$R = -2.117 + 0.4138 \times \text{Log}_e (B) \; r^2 = 91.8\% \; N = 9.$$

The precision of this relationship is further evidence of the dependence of pelicans on the anchovy population (Figure 1). Alec MacCall has used this relationship to estimate the relative long-term mean productive success of brown pelicans with various harvest strategies for anchovy.

Preparations Made for FAO Fishery Consultation

Fishery biologist Alec MacCall completed a review paper entitled "Variability of pelagic fish stocks off California" which will be presented at the FAO Expert Consultation on Neritic Fish Stocks (San Jose, Costa Rica, April 18-29, 1983). The paper examines stock status and trends for several small pelagic fishes (sardine, anchovy, Pacific and jack mackerel) and larger predators (bonito, white seabass, barracuda), as well as mechanisms causing or influencing variations in their abundance. Also, a paper entitled "Egg mortality of the Peruvian anchovy (Engraulis ringens) caused by cannibalism and predation by sardines (Sardinops sagax)" was coauthored by H. Santander (Instituto del Mar del Peru, IMARPE) J. Alheit (German-Peruvian Cooperative Project), MacCall, and A. Alamo (IMARPE), and was submitted to the same Consultation. In preparation for the workshops following presentation of the papers at the Consultation, Mr. MacCall met with other session chairmen (Mr. Andy Bakun, SWFC-PEG, and Drs. Richard Parrish, SWFC-PEG and Michael Glantz, ENCAR) at PEG in Monterey to coordinate agendas of the respective working group discussions.

Anchovy Plan Revision Completed

Fishery biologists Alec MacCall and Richard Methot, and industry economists Daniel Huppert and Cynthia Thomson spent considerable time this month completing a second draft revised anchovy management plan for presentation to the Pacific Fishery Management Council (PFMC) in May. Several sections of the draft revised plan were completed, including most of the Environmental Impact Statement, and the Regulatory Impact Review. Two impartial outside scientists (Drs. John Beddington, International Institute for Economic Development, London, and Norm Wilimovsky, University of British Columbia, Vancouver) have been contracted to review parts of the draft revised anchovy plan concerning the biological assessment of the anchovy population. Other reviews are being done by fishing industry consultants. The anchovy team has been maintaining open communication with these reviewers.

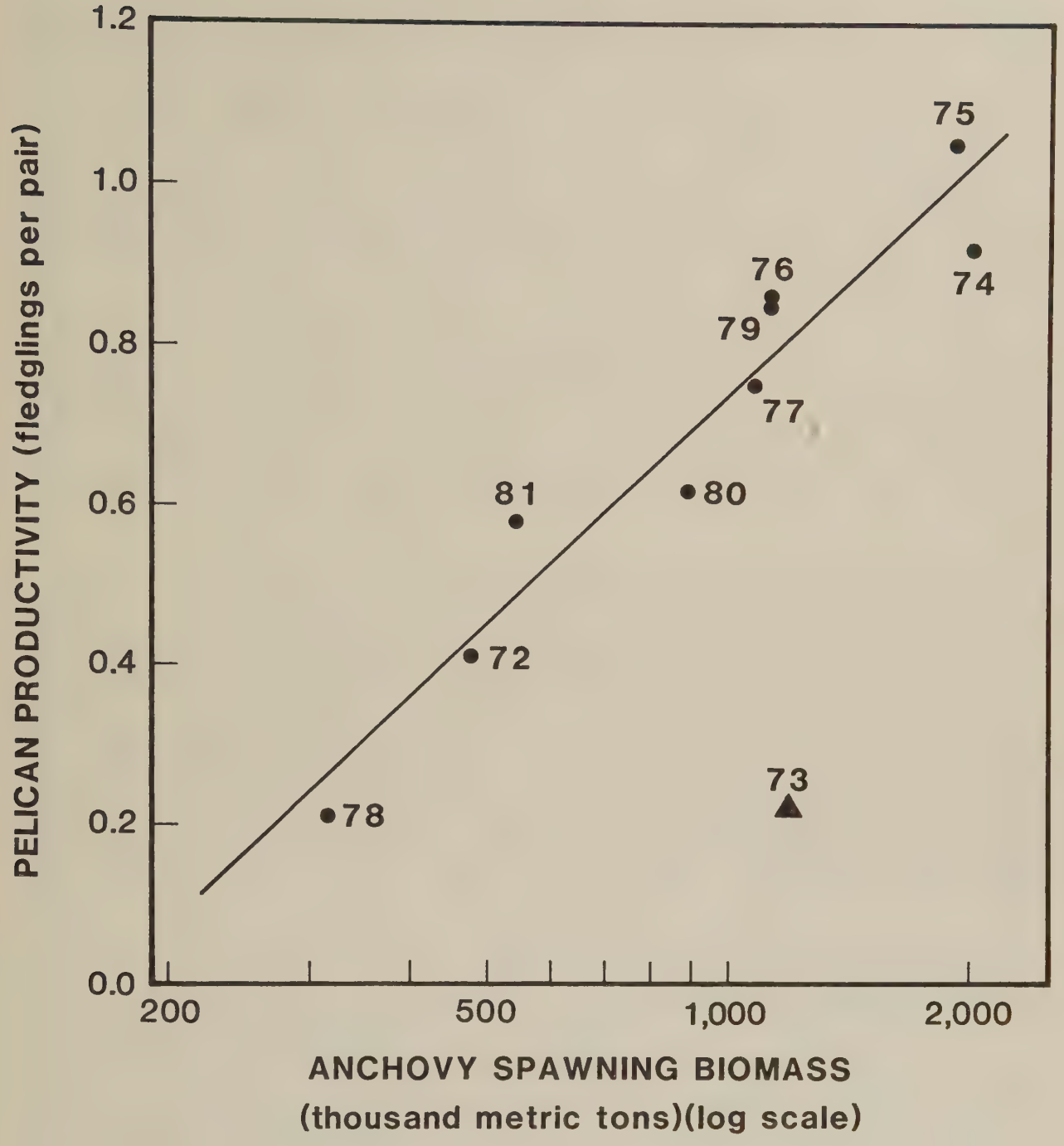

Figure 1. Relationship between pelican reproductive success and anchovy spawning biomass. The 1973 value is biased by pelican immigration and is not included in the regression.

Egg Production Manuscripts Revised

Susan Picquelle, Statistician, received two peer reviews of the manuscript "The northern anchovy spawning biomass for the 1982-83 California fishing season" authored by herself and fishery biologist Roger Hewitt. She made the needed changes and clarifications, and the manuscript will be published in the CalCOFI Reports as a scientific contribution after Hewitt makes the necessary revision of his section of the manuscript.

Picquelle also completed her contribution to the manuscript "Egg production estimates of spawning biomass of the northern anchovy for 1980 and 1981" which is authored by Gary Stauffer, Fishery Biologist at the Northwest and Alaska Fisheries Center and herself. Her last task was to re-estimate the variance of the estimate of batch fecundity (number of eggs spawned per batch per mature female). The new variance formula includes the added source of variation due to the fact that the batch fecundity for each female in the sample is estimated rather than observed directly and there is variability about each estimated value. Each individual batch fecundity is estimated from the regression of batch fecundity on gonad-free body weight for a subsample of females which contain hydrated eggs that are about to be spawned. This regression was linear for the two 1981 surveys and non-linear for the 1980 survey.

Consulting Project for Southwest Region Completed

Statistician Susan Picquelle assisted Gary Galbraith, Southwest Region, with his task of measuring the reliability of the data base which Galbraith uses for enforcement purposes. The reliability is measured by estimating the probability that a record contains one or more errors. Picquelle provided Galbraith with detailed instructions on how to estimate that probability. She suggested that he draw a random sample of records from his data base, record the number of errors in each record, and form an observed distribution of errors. He should then fit a Poisson distribution to the observed distribution of errors, and then use the fitted Poisson distribution to produce the desired probability statement.

Recreational Fisheries Study Begins With Workshop at Tiburon Laboratory

Dr. Dan Huppert, Industry Economist, began to implement the recreational fisheries study proposed in the Southwest Fisheries Center/Southwest Region economics research program for FY 83. The first step involved holding a workshop at Tiburon on March 23, the objective of which was to determine what the recreational constituents considered to be the most important problems and issues for the National Marine Fisheries Service (NMFS) to be studying. The 20 participants came from NMFS, California Department of Fish and Game, the Coastal Zone Commission and local San Francisco Bay area recreational fishing groups (including the Tyee Club, United Anglers of California, Golden Gate Sport Fishers, Marin Rod and Gun Club and others). Six general areas seemed to be of most concern: (1) protecting and enhancing of anadromous fish species, (2) determining the economic value (or impacts) of recreational

fishing, (3) determining the effects of commercial fishing (especially with net gear) on recreational fishing, (4) dealing with pollution problems affecting fish and shellfish (especially clams and oysters) and public health in the Bay, (5) assuring adequate access to public facilities by recreational fishermen, and (6) accomplishing public trust responsibilities of the Federal and State agencies.

The next step in the recreational study will be the advertising of a Request for Proposals to examine and analyze the existing recreational data. The main objective of that analysis will be to estimate economic values of fishing in various modes and regions, and, second, to determine what modifications of the data collection methodology would be needed to support more detailed economic analysis of recreational fishing in California.

Oceanic Fisheries Resources Division

TUNA AND BILLFISH RESOURCES PROGRAM

Seminar on Mitochondrial DNA Work Presented

Dr. John Graves, a post-doctoral research associate sponsored by the National Research Council, presented a seminar describing his current research on mitochondrial DNA (mtDNA) this month. In his seminar, he detailed the use of restriction enzyme analysis of mtDNA and how the results can be utilized in managing fish and marine mammal populations. Various methods of determining stock divisions (both genetic and non-genetic) were discussed.

Graves illustrated the talk with results from a study of Atlantic and Pacific skipjack tuna, dolphin fish, and shorefishes from both sides of the Isthmus of Panama. In particular, he noted that the highly migratory, schooling skipjack do not show any mtDNA differences (0% sequence divergence) from the Atlantic and Pacific Ocean basins. Although there are no mtDNA from other fishes with which to compare these results, populations of a single species of gopher, living within 50 to 100 miles of each other, show mtDNA sequence differences of 1.5% to 3.0%. Graves suggested that movement of skipjack tuna is possible at all times of the year around the tip of Africa and that since skipjack do not usually travel alone but in huge schools, one (or several) school making the trip could easily swamp out any nascent genetic differentiation between ocean basins.

MARINE MAMMAL BIOLOGY PROGRAM

SWFC Scientists Attend the Eighth International Meeting on Marine Mammals of Baja California

Dr. Douglas DeMaster, Leader of the Coastal Marine Mammal Project (CMMP) and Mark Lowry, Task Leader of the Food Habits Task (CMMP) attended the Eighth

Annual Meeting of the Marine Mammal Society for the study of Marine Mammals, held in La Paz, Mexico, from 17-19 of March 1983. Twenty-one papers covering research on marine mammals that occur in Mexico were given. Prior to the opening session, a Board of Directors' meeting was held to elect new Board members (DeMaster represented Dr. William Perrin of the Southwest Fisheries Center, on the Board). Dr. Howard Braham, National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center, was elected to replace Dr. Perrin on the Board.

A number of papers were particularly pertinent to the goals of the Coastal Marine Mammal Program. One paper by David Aurioles and Esteban Alvarado described the results of a mark/recapture study of California sea lion pups, and extensive resight effort at all of the major hauling sites in the Gulf of California. Approximately 30 pups-of-the-year were hot-branded, and of these roughly 50% were sighted as yearlings. This may represent the best available estimate of pup survival for California sea lions because of the high visibility of this type of mark. A second paper on California sea lions by David Aurioles discussed a new hypothesis relating observed age structures of sea lions, mortality patterns of sub-adult males, and movement patterns of sub-adult males. Another paper on California sea lions by John Francis and Carolyn Heath concerned studies comparing various techniques to estimate pup mortality from beach censuses and comparing the feeding times of sea lions from different rookeries in the Channel Islands, California (this research was sponsored by the Coastal Marine Mammal Project). Francis and Heath reported that bi-weekly or monthly counts of dead pups will underestimate total pup mortality by as much as 75%. They were able to calibrate pup mortality on beaches that were censused every day with beaches that were censused less frequently. They are currently working on a correction factor to estimate pup mortality based on bi-weekly census data.

A paper by Heath and Francis on food habits of California sea lions compared the average duration of time spent at sea (presumably feeding) from San Nicolas and Santa Barbara Islands. They found that animals from Santa Barbara Island spent less time feeding than animals from San Nicolas. A comparison of the species composition of the diet from both rookeries is currently underway.

On the last day, the participants split into two working groups to discuss recommendations for research on a) pinnipeds and sirenians, and b) cetaceans. Both DeMaster and Lowry participated in the pinniped discussion group. Most of the recommendations discussed by the working group concerned determining the impact of sea lions on commercial fisheries, identifying causes of mortality and problem areas for the management of manatees, and the need for current counts of Guadalupe fur seal pup production during the breeding season. Recommendations from both working groups were then presented to the entire body. Recommendations will be further reviewed by the Board of Directors, and final recommendations will be made to the Mexican Department of Fisheries. The new president of the Society, Mr. Louis Fleischer, was installed during the final session of the meeting.

Scientific Review Panel Meets on Age Determination

On March 4 and 5, the Staff of the Oceanic Fisheries Resources Division hosted a panel meeting of selected biologists to review manuscripts produced by the Division on dolphin age determination research. The meeting, chaired by operations research analyst Dr. Steven Reilly, Southwest Fisheries Center (SWFC), was one in a series of panel sessions scheduled this year to provide rigorous peer review of research documents to be used in the 1984 assessment of dolphin stocks in the eastern tropical Pacific. Attending the meeting were reviewers Dr. Robert Brownell, U.S. Fish and Wildlife Service, Dr. Douglas Chapman, Marine Mammal Commission, Dr. Frank Hester, Living Marine Resources, Inc., Dr. Donald Siniff, University of Minnesota, and Dr. Alex Wild, Inter-American Tropical Tuna Commission. Manuscript authors, (Dr. Philip Hammond, IATTC, zoologist Ms. Aleta Hohn, wildlife biologist Dr. Al Myrick, and the panel leader, Dr. Steve Reilly) attended the panel meetings to provide summaries of the documents and to participate in the discussions.

Four manuscripts were discussed: (1) Myrick et al. "Estimating ages from teeth of spotted and spinner dolphins," (2) Myrick et al. "Calibration of dental layers in seven captive Hawaiian spinner dolphins based on tetracycline labeling," (3) Hohn and Hammond, "Growth in the first year of the offshore spotted dolphin in the eastern tropical Pacific," and (4) Reilly et al. "Precision of age determination of northern offshore spotted dolphins." The authors presented synopses of the papers and then responded to questions, criticisms, and recommendations of the review panel. A report containing the final recommedations was prepared and is available for distribution.

Age Data for 1981 Female Spotted Dolphins Ready

Aleta Hohn, Zoologist, announced this month that a data file containing age estimates for 318 female spotted dolphins collected from the eastern tropical Pacific in 1981 has been prepared. The age data are currently undergoing analysis to determine age-specific vital rates which will be compared with the results of an identical analysis on approximately 800 females take in 1973 through 1978.

Manuscript Completed on Parturition Marks in Teeth of Female Spotted and Spinner Dolphins

Drs. Galina A. Klevezal, USSR Academy of Sciences and Albert C. Myrick, Jr., Leader, Marine Mammal Age Determination Project, Southwest Fisheries Center have submitted a manuscript to the Journal of Mammalogy reporting the presence of parturition marks in the dentine of sexually mature female dolphins. In decalcified and hematoxyline-stained thin sections, teeth of female spotted dolphins were found to exhibit a deeply stained layer (DSL) at one or more of their annual dentinal layers. Klevezal and Myrick made DSL counts without prior information on reproductive condition, in order to determine if the layers indicated parturition periods. When DSL counts were compared with the corresponding reproductive condition in 75 sexually mature

females, an exclusive association ($P_{x_2} < .001$) between DSLs and the post-partum condition was found.

Further, the teeth of a captive female Hawaiian spinner dolphin, labeled with tetracycline 1 month after she gave birth to a calf, contained a dentinal DSL near the label. The researchers have concluded that the number of DSLs is likely to correspond to the minimum number of calves born. DSL counts may thus be useful in estimating birth rates in Stenella spp.

MARINE MAMMAL MONITORING AND ASSESSMENT PROGRAM

Surveyor Departs for ETP

On March 7, a research team headed by fishery biologist Dr. Roger Hewitt began a month-long study of dolphin behavior in the eastern tropical Pacific (ETP). The group was transported by helicopter from the Scripps Institution of Oceanography parking lot in La Jolla to the NOAA research vessel, Surveyor, waiting offshore.

During the cruise, researchers will make aerial observations from the Surveyor's helicopter of the reaction of dolphin schools to the approaching research ship. Population counts used for assessment of dolphin populations are made by shipboard observers; the research plan is designed to find out whether the presence of the research ship is biasing those counts by affecting the dolphins' behavior.

Following a week of observing the dolphins' reaction to the steam-powered Surveyor, the ship will rendezvous with the NOAA research vessel David Starr Jordan. The Jordan, a diesel-powered vessel, has been used since 1974 for dolphin population surveys in the ETP. Scientists will also make aerial observations of the reaction of dolphins to the Jordan, to find out if the animals behave differently in the presence of the noisier ship.

In addition to their observations, the researchers will take aerial photographs of the dolphin schools, which will be used to document species identification, schools structure, behavior, and school size.

Cmdr. Fidel Smith, Executive Officer, on the bridge of the Surveyor.

The Southwest Fisheries Center (middle of picture) and Scripps Institution of Oceanography, as seen from the Surveyor's helicopter.

Miles Croom, helicopter pilot, about to set down on the Surveyor.

Dr. Roger Hewitt, Chief Scientist (right) and Lt. jg Miles Croom, helicopter pilot, chat with Bob Sandquist, Captain of the Surveyor.

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Sampling Capability Expanded

Anticipating the possibility of reduced opportunity to sample from the NOAA research vessel David Starr Jordan during coming months, fishery biologist Tony Chess and biological technician Dan Howard this month rigged a Boston whaler for some of the required trawling operations for juvenile fishes and euphausiids. A new midwater trawl, specially designed to perform within the power capabilities of the whaler, was tested in San Francisco Bay with promising results. Equipped with 24" super Krub doors, the trawl has a 10' x 10' mouth, and cod-end of 0.25" bar mesh. It is powered by a double-drum electrical winch, with 400' of 0.25" stainless steel wire rope on each drum that should permit sampling to depths of about 65 m.

Dan Howard, Pete Adams and Tony Chess test the new midwater trawl in San Francisco Bay.

Offshore Zooplankton Data Processed

Susan Smith, Fishery Biologist, reports that computer analyses of the shortbelly rockfish (Sebastes jordani) zooplankton data were completed this month, with the help of Nancy Wiley, Computer Programmer Analyst. The data represent the results of 2-1/2 years of day-night and depth-stratified sampling of potential shortbelly rockfish prey at Tiburon's offshore sampling site near Ascencion Submarine Canyon.

PHYSIOLOGICAL ECOLOGY INVESTIGATION

Richardson Bay Study Revisited

During 1972 and 1973, an intensive multi-disciplinary ecological study was done in Richardson Bay, California, by the Tiburon Laboratory. Richardson Bay is a small (approximately 15.5 km^2) shallow embayment just inside and to the north of the entrance to San Francisco Bay. It is analagous to, and shares many characteristics with, the much larger San Francisco Bay/Delta estuary -- extensive mudflats, vertical mixing, narrow drainage channels and urbanized shorelines. The objectives of the study were to describe this environment and to develop a better understanding of the relationship between the fish community and its habitat. Fishery biologist Mickey Eldridge participated in this study and is now involved in analyzing data from the trawl and gill net aspects of the study. Using component factor analysis (a multivariate statistical method), both habitat and fish community performances were studied and found to be spatially and temporally dynamic. The fish community was diversified with 40 species represented, dominated primarily by 5 estuarine species: shiner perch, white seaperch, English sole, jacksmelt, and topsmelt. Differences between trawl and gill net catches demonstrated that more than one method is needed to sample the fish community adequately. As expected, gill nets captured more pelagic forms; 11 species comprised 95% of the total gill net catch. Conversely, the trawl sampled demersal fishes; 8 species made up 95% of the total trawl catch. The total number of species and species catches were associated with the embiotocid perches, jacksmelt and English sole.

Abiotic factors within the habitat showed close association between precipitation, salinity and temperature. Periods of precipitation caused lower salinities and temperatures, in association with higher runoff and sewer outflows. As a result, turbidity increased with decreasing depth. As a result of these conditions, the number of fish species and total catches were inversely related to salinity and temperature.

Further analyses are planned to examine specific variable relationships. The importance of this study lies in the extent to which such shallow bays are shown to serve as natural fish habitats. Management of these areas depends on understanding these basic relationships.

UNDERUTILIZED FISHERY RESOURCES

Storms Dampen California Fisheries

The weather has been the biggest fishing news this winter. Fishermen and processors along the California coast are suffering from the effects of a series of winter storms. Fishery biologist Sus Kato reports that movement of fish from traditional fishing grounds has occurred in many areas. High seas have also prevented crabbers in northern California from retrieving their pots for nearly 2 months. At Santa Barbara, the harbor entrance has been blocked for the same period, and many fishing vessels have been locked in. At San Pedro, "wetfish" (mackerels, squid, anchovy) have been scarce, probably due to unusually high water temperature, a result of "El Niño" conditions. One of the immediate manifestations of the inability of fishermen to catch fish, or even go out to fish, is the increased amount of correspondence and telephone calls we have received from fishermen looking for alternatives. This increase in calls is largely tied to the long period of inactivity ashore. The two most frequently-asked questions were related to fishing for squid and spot prawns. Members of the task have met with many fishermen and processors to discuss these and other alternative fisheries, and we have loaned small amounts of gear to several fishermen who wished to experiment before seriously considering entering a new fishery.

Rock Crab Markets Tested

Rock crabs have been fished commercially in southern California for years, and it appears that the northern California population could also support a fishery. An impediment to development of a fishery in the north is the lack of markets, because Bay Area residents are unfamiliar with rock crabs.

This month, fishery biologist Sennen Salapare had several hundred pounds of live rock crabs delivered by a Eureka-based fisherman to a Bay Area fish broker. The test marketing results indicate that crabs must be in a good condition to attract consumers. Subsequent meetings among fishermen and the buyer resulted in an agreement on time, place of delivery, and shipping procedures. These agreements should help to assure a high quality crab product.

Although dungeness crabs are presently expensive, shoppers have not been receptive to rock crabs as a substitute. Persons of Filipino extraction purchased rock crabs, but they are more used to buying live blue crab from the East Coast, which has been marketed here for several years at a price similar to rock crab.

PACIFIC ENVIRONMENTAL GROUP

FISHERY/ENVIRONMENTAL MONITORING AND FORECASTING TASK

Study of Environment's Effect on Anchovy and Pilchard Reproduction Completed

A synthesis of the relationships between environmental processes and the reproductive pattern of anchovies and pilchards was recently completed by fishery biologist Richard Parrish, oceanographers Andrew Bakun and David Husby, and commissioned officer Craig Nelson. Parrish and Bakun will present the results of this work at the FAO-IOC consultation on neritic fish stocks which will be held in San Jose, Costa Rica, in April 1983. The manuscript describing the study, entitled "Comparative climatology of selected environmental processes in relation to eastern boundary current pelagic fish reproduction," will be published in the proceedings of the meetings. This work is a milestone in the accomplishments of the Eastern Boundary Current Study Team at the Pacific Environmental Group.

The results of the study suggest that reproductive strategies of anchovies and pilchards (sardines) are not strongly influenced by an optimum temperature, for spawning occurs over a wide temperature range (12-24°C). However, spawning grounds and seasons do appear to be strongly influenced by turbulent mixing and transport. Spawning occurs mainly in areas and during seasons with weak offshore, or onshore transport, and low turbulent mixing. Of the regions examined, the three spawning areas which share the most characteristics are the southern California Bight, the Walvis Bay-Palgrave Point region of the Benguela Current and the northern Chile region in the Peru Current. The Chimbate-Callao region in the Peru Current is unique in that it has strong year-round upwelling with little turbulent mixing, and has had the largest single stock.

The four major eastern boundary current regions of the world ocean (i.e., the California, Peru, Canary, and Benguela system) appear to involve similar environmental dynamics and contain very similar assemblages of important pelagic fish species. To the extent that corresponding species in different systems function as analogues, interregional comparative studies may yield information concerning environmental effects on reproductive success that is difficult to derive from any single regional system.

The historical archives of maritime weather reports provide a data base for assembly of seasonal and geographical climatologies of ocean processes in the various regions in similar formats. These form a basis for pattern recognition of similarities and differences in the various spawning environments of corresponding species. Natural selection implies that observed reproductive habits represent successful accommodation to the most crucial environmental factors. Thus compelling patterns in reproductive and environmental relationships are suggestive of important causal linkages.

The deduction of crucial environmental factors in this manner may provide a rational basis for limiting choices of explanatory variables, thereby allowing more effective use of severely limited time series of annual data points in formulating empirical environmentally-dependent recruitment models. Also, focusing on the most crucial stock - environment interactions may provide a basis for using experience gained in one regional system to predict outcomes of actions taken in another system.

Data on the primary causative variables (food, predation, density-dependent mortality, etc.) are not generally available. Therefore we focus on several processes which can be addressed using maritime data. These processes are thought to impact the early life history stages of fishes by altering the primary causative variables, particularly food. They include: (1) wind-generated turbulent mixing, thought to disperse fine-scale concentrations of food particles required for successful larval first-feeding; (2) offshore transport, which may carry planktonic eggs and larvae away from the favorable coastal region; (3) coastal upwelling, which may be favorable at appropriate spatial and temporal lags but unfavorable when it is spatially and temporally coincident with spawning. Temperature is a primary causative variable in its direct effect on physiological processes.

The four major eastern boundary currents have a great deal in common. The locations and seasonality of maximum offshore Ekman transport appear to be closely related to the seasonal latitudinal shift of the atmospheric pressure systems and the relationships between these systems and the large-scale topography of the continents. However, as can be seen in the environmental features presented, there are also large differences among them. For example, all four systems have maximum cold inshore-offshore temperature anomalies associated with summer maxima of offshore Ekman transport. These summer "maximum upwelling regions" have anchovy and/or sardine stocks with spawning grounds poleward and equatorward of them. The California and Benguela systems each have a single area with cold sea surface temperature anomalies. In the California system this area is located in the summer upwelling maximum, whereas the Benguela system's area includes the summer upwelling maximum at Luderitz and a winter upwelling maximum at Cape Frio. The Peru and Canary systems each have two separate areas of cold sea surface temperature anomalies. The Peru system has an area located at the winter upwelling maximum (San Juan to Chimbote) and a second area in the upwelling region off central Chile which has a summer maximum near Talcahuano. The Canary system has a summer upwelling maximum off Lisbon and a second summer upwelling maximum between Cap Sim and Cap Blanc. During the winter the cold water anomaly off northwest Africa shifts south and the upwelling maximum then extends from Cap Blanc to Cap Vert.

Upwelling centers, characterized by strong offshore transport, intense wind-generated turbulent mixing, and reduced water column stability appear to be avoided in spawning habits. Spawning grounds of anchovies and sardines tend to lie within coastal indentations where wind-induced transport and turbulence are reduced and continental shelf width tends to be greater. The spawning grounds of the largest populations tend to be downstream (equatorward) of upwelling centers.

The Peruvian anchoveta population, which has reached the largest size of any eastern boundary current stock, spawns in an area of strong upwelling; we hypothesize that in this case a particularly wide coastal habitat and the dependence of Ekman layer depth on both latitude and stratification may serve to reduce the detrimental effect of offshore surface Ekman transport.

Patterns of avoidance of turbulent mixing and offshore transport in reproductive habits suggest that these processes have exerted important controls on reproductive success. Thus these variables appear to merit consideration in modeling recruitment variations. In regions where characteristic temperatures are within physiological limits, temperature does not appear to be a dominant factor in determining spawning habit.

The oxygen minimum layer off Peru is very shallow compared to the other regions. We suggest that this may lead to decreased competition to pelagic fishery stocks from mesopelagic fish species.

FISHERIES INFORMATION SYSTEMS AND AUTOMATIC DATA PROCESSING

CALFIN-Update

The implementation of the salmon credit card system is on schedule, according to Fred Kellenberger, Data Systems Manager. An exemption from the California Department of Fish and Game (CDF&G) purchasing freeze has now been obtained for the purchase of the card imprinters for the trawl system. A new completion date of July 1, 1983, has been established for the completion of the system.

Data entry for California landings data is going smoothly: about 80% of the data has now been keyed and verified. A preliminary summary of the 1982 landings data was completed ahead of schedule; 1983 landings data is presently on schedule.

A meeting was held on March 8, 1983, at the La Jolla Laboratory to complete the CALFIN planning chart. Norm Abramson, Tiburon Laboratory, Tim Farley, California Department of Fish and Game (CDF&G), Svein Fougner, Southwest Region (SWR), Dick Heimann (CDF&G), Mel Odemar (CDF&G), Gary Smith (SWR) and Fred Kellenberger, Southwest Fisheries Center, attended the meeting. Priorities were established for the CALFIN activities and the principal responsible agency was defined for the highest priority activities.

WPACFIN Data Collecting and Processing Activities Continuing

David C. Hamm, Computer Systems Analyst, reports that the draft final reports for developing statistically sound fisheries data collecting and processing systems for Guam and the Commonwealth of the Northern Mariana Islands (CNMI) were received during March. The Guam document has been reviewed by several members of the Honolulu Laboratory staff and comments have been forwarded to the contractor. The CNMI report is similar to the Guam report and will be revised after the Guam report is finalized.

The WPACFIN microcomputer located in the Office of Marine Resources (OMR) Government of American Samoa developed some hardware problems, but through use of the Diagnostic and Maintenance software, the bad RAM chip was located and replaced quickly. System down time was less than 1 day. The OMR is still looking for a new WPACFIN Coordinator to replace the former coordinator who is now on the staff of the Governor of American Samoa. In spite of the vacant position and the minor hardware trouble, data collecting and processing activities are going fairly well in American Samoa.

The WPACFIN Coordinator for the Guam Division of Aquatic and Wildlife Resources (DAWR) has also accepted another position and will be leaving DAWR by early April. The resignations of the WPACFIN Coordinators in American Samoa and Guam will cause some slowdown in implementation of the system and increase the need for additional training in these areas. However, the

remaining staff in both areas are capable of maintaining daily routine data collection and processing operations until replacements can be hired and trained.

Progress in ADP Operations at the La Jolla Laboratory

Dorothy Roll, Computer Systems Analyst, reports that all procurement requests submitted to Washington, DC, during February and early March have been approved. They are: 1) the Molecular Super Micro 64X with a Cipher Data Unit, 9-track 1600 bpi tape drive for the La Jolla Laboratory, 2) the computer services contracts with the University of California, San Diego (UCSD) for the La Jolla Laboratory and the Univeristy of Hawaii (UoH) for the Honolulu Laboratory for a 15-month period from July 1, 1983 through September 30, 1984, 3) a data set and lease line for communication between the IBM system at the University of Hawaii and the Molecular Super Micro 64X in the Honolulu Laboratory, and 4) for the Honolulu Laboratory, five CRT terminals compatible with their Molecular 64X and Gifford microcomputers (three of the five terminals are equipped with the WORDSTAR proms and key caps).

A request to purchase a Tele Video 800A work station for the Tiburon Laboratory was sent to Washington, DC, for approval processing. This work station will interface with the Tiburon Laboratory's existing Tele Video 806 multi-user computer and allow two users on the system simultaneously.

New Evaluation System Implemented

On March 14 and 15, Susan Iacometti, Computer Systems Programmer, was trained on the computer access of Trade-Off Analysis by Dr. Aleko Christakis, consultant for policy planning techniques. Dr. Christakis is the Associate Director of the University of Virginia's Center for Interactive Management. Trade-Off, implemented on the University of Virginia's CDC CYBER 730, is associated wth the Interpretive Structural Modeling (ISM) Technique used in conducting policy planning/decision making meetings. Trade-Off is an evaluation system designed to facilitate the comparison and trade-offs among alternatives so that a preferred alternative can be identified and the decision rationale documented.

"Motherboards" Received

ADP Operations received the upgraded "Motherboards" for the La Jolla Microsystems. The "Motherboards" are actively terminated at both ends to allow for more reliable performance from the microsystems. Robert Nydam, Computer Programmer Analyst, installed and tested the "field upgrade" on the La Jolla microunits. Al Coan, Mathematician, assisted Mr. Nydam in the installation of the boards for the microsystems in the Oceanic Fisheries Resources Division. The "Motherboards," with instructions for installing,

were sent to the users in the Tiburon Laboratory and the Regional Office in Terminal Island.

WORDSTAR to be Tested by Secretarial Staff

William Tester, the electronics specialist under contract, completed the INSTALL patch on WORDSTAR for the TAB terminal. The TAB 132/15 CRT terminal features the IBM selectric keyboard and the 132 column viewing without horizontal scrolling on the 15" diagonal screen. On March 20, Andy Dizon in the Oceanic Fisheries Resource Division (OFRD) gave an overview of WORDSTAR to key members of the secretarial staff. For the presentation in the auditorium, he used the La Jolla Standard Microcomputer with the TAB terminal linked to the visual equipment which projected the contents of the CRT screen onto the 5' daytime screen. Julie Shoemaker of the Coastal Fisheries Resource Division (CFRD), Frances Begley in OFRD, and Lorraine Prescott and Mary DeWitt in the Technical Support Group, will familiarize themselves with WORDSTAR. Ms. Iacometti, assigned WORDSTAR consultant, will assist them in their training on the La Jolla Standard Microcomputer in ADP operations. ADP Operations is contacting local vendors on the possibility of their loaning WORDSTAR compatible terminals to the SWFC for evaluation by SWFC's secretarial staff.

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Richard Charter, Computer Specialist, Al Coan, Mathematician, Dorothy Roll, Computer Systems Analyst, and Susan Iacometti, Computer Systems Programmer, traveled to Las Vegas on March 16, to attend the 2-day joint conference hosted by the Southern California/Arizona and the Northern California/Nevada Federal ADP Councils. Invited speakers from the government and industry spoke on "Information Resources Management Strategies for the Mid to Late 1900's."

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A new labor object class breakdown has been implemented in the Financial Reporting System reports by Mr. Nydam. Several old object classes are now being recorded individually instead of being combined. Because the new elements were introduced into the Labor and Plan data files, all monthly reports were affected.

MISCELLANEOUS

HONORS AND AWARDS

Center Authors Receive Best Publication Award for Fifth Consecutive Year

For the fifth consecutive year, a paper from the Southwest Fisheries Center has been selected as the best publication appearing in the Fishery Bulletin. The current Center authors so honored are John Hunter and Roger Leong, for their "outstanding original scientific work contributing to the NMFS mission"--"The spawning energetics of female northern anchovy, Engraulis mordax," which appeared in a 1981 issue of the Fishery Bulletin.

Two other Center-produced papers were awarded Honorable Mention Recognition. Honored were Ted Hobson, William McFarland and Tony Chess for their 1981 Fishery Bulletin paper, "Crepuscular and nocturnal activities of California nearshore fishes, with consideration of their scoptopic visual pigments and the photic environment" and Walter Matsumoto, Tom Kazama and Don Aasted for their 1981 Marine Fisheries Review paper, "Anchored fish aggregating devices in Hawaiian waters."

PUBLIC RELATIONS

Honolulu Laboratory

March 16 - Dr. Robert A. Skillman, Thomas S. Hida, and Samuel G. Pooley spoke at the Waikiki Aquarium Lecture Series on the Honolulu Laboratory's recreational fishing project. Dr. Skillman described the goal and objectives of the project and how they relate to the NMFS national policy on recreational fishing. Some results of the National Recreational Fishing Survey for 1979 were also presented. Hida described activities to obtain catch data from recreational fishermen fishing clubs and presented results based on data obtained from a charter boat, the newspaper Hawaii Fishing News, and several fishing clubs. Pooley explained the importance of assigning value to recreational fishing activities and reviewed some of the newer techniques that are now being or will be employed in Hawaii.

18 - William G. Gilmartin, Leader of the Marine Mammals and Endangered Species Program spoke on "Marine mammals and endangered species issues" at a University of Hawaii seminar (Zoology 691b) in the Honolulu Laboratory seminar room.

La Jolla Laboratory

March 15 - Dr. Doug DeMaster, Wildlife Biologist, presented a talk on the marine mammal/fishery interaction problems to the San Diego Kiwanis Club.

22 - Six students from the Encanto School visited the La Jolla Laboratory, where they interviewed a number of the researchers and staff.

23 - Dr. Dan Huppert, Industry Economist, chaired a meeting at the Tiburon Laboratory for recreational fisheries constituents and State-Federal personnel involved in recreational fisheries. Dr. Izadore Barrett, who attended the meeting, termed it very successful and said he was pleased with the response of the participants.

Tiburon Laboratory

March 12 - A group from Salmon Unlimited, an organization of recreational and commercial salmon fishermen, met at the Tiburon Laboratory to hear a presentation on striped bass research given by Jeannette Whipple, Chief of the Physiological Ecology Investigation. Paul Engler of the San Francisco Tyee Club also gave a talk which described the club's salmon pen rearing activities at Tiburon Laboratory. The meeting was arranged by Bruce Wyatt, U.C. Sea Grant Marine Advisory Agent.

PRESS RELEASES

La Jolla Laboratory

March 1 - "Dolphin Observers Set for Take-Off."

8 - "El Niño May Change Local Fishing Prospects."

10 - "U.S. - Soviet Research Cruise Scheduled." (update)

SEMINARS

Honolulu Laboratory

March 4 - Robert E. Bourke, Department of Animal Sciences, University of Hawaii, spoke on "Causes of mortality in skipjack tuna, Katsuwonus pelamis, following capture stress."

23 - Dr. Robert E. Kearney, South Pacific Commission, Noumea, New Caledonia, spoke on "Western Pacific skipjack tuna resources and recent changes in the fisheries."

25 - Dr. Phil Lobel, Harvard University Center for Earth and Planetary Physics, spoke on "Eddy currents and the life history of Hawaiian reef fishes."

La Jolla Laboratory

March 10 - Dr. Nancy Lo, Mathematician, presented a talk entitled "Egg Production of the central stock of northern anchovy, 1951-1982."

28 - Mr. William Wallace, Associate Director, Office for Civil Rights, NOAA, presented "Counseling and complaint process: Why, What, How."

29 - Dr. John Graves, Post-Doctoral Research Associate, National Research Council, NOAA, SWFC, presented "Restriction enzyme analysis of mitochondrial DNA: The technique, its fisheries applications and results of a study of Atlantic and Pacific skipjack tuna."

TRAINING

La Jolla Laboratory

March 9 - Susan Iacometti, Computer Specialist, "Managing Time," San Diego, California.

13 - Norm Bartoo, Fishery Biologist, "OPM Management Course," Denver, Colorado.

15 - Virginia Hostler, Administrative Officer, "Upward Mobility," Phoenix, Arizona.

22 - Virginia Hostler, Administrative Officer, "Employee Benefits," Phoenix, Arizona.

24 - John Carr, Deputy Director, "OPM Management Institute," San Diego, California.

MEETINGS AND TRAVEL

Honolulu Laboratory

March 1-3 - David Hamm represented Fred Kellenberger at the National Data Managers Committee meeting in Miami, Florida.

1-4 - Richard Shomura traveled to California to meet with the staff of the Tiburon Laboratory and to participate in the Southwest Fisheries Center and Southwest Region management meetings at Dana Point, California.

10 - Richard Shomura, Richard Uchida, and Dr. Jeffrey Polovina, attended the meeting of the Coordinating Council for Research--Northwestern Hawaiian Islands.

17-18 - Richard Shomura and several Honolulu Laboratory staff members met with Western Pacific Program Office, Southwest Region, to discuss bottom fishes.

La Jolla Laboratory

March 1-4 - Dr. Izadore Barrett, Mr. John Carr, Mr. Dave Mackett, Dr. Reuben Lasker, Mr. Fred Kellenberger, Dr. Gary Sakagawa, and Mr. Ben Remington traveled to Dana Point, California, to attend a joing meeting of the Southwest Fisheries Center Management Team and the Southwest Regional Office staff.

4-7 - Doug DeMaster traveled to San Nicolas Island to collect elephant seals for UCLA/LA County Museum.

6-24 - Paul Smith traveled to Lima, Peru, to complete papers on sardine and anchovy egg production and to Santiago, Chile, to present a workshop on the SWFC egg production method.

7-11 - John Hunter traveled to Honolulu, Hawaii, for a program review of the Kewalo Basin facility.

7-14 Ben Remington traveled to Washington, DC, to coordinate financial/administrative matters with NMFS/NOAA/Payroll.

13-25 - Norm Bartoo traveled to Denver, Colorado, to attend OPM Management Course for new managers.

14-16 - Izadore Barrett and Dan Huppert traveled to Portland, Oregon, to attend a Pacific Fishery Management Council meeting.

15-18 - Ben Remington travled to Boulder, Colorado, to attend ASC/ADP second quarterly meeting.

15-19 - Doug DeMaster traveled to La Paz, Mexico, to meet with Mexican scientists on joint sea lion research.

16-18 - Dorothy Roll, Susan Iacometti, Rich Charter, and Al Coan traveled to Las Vegas, Nevada, to attend a Federal ADP Council Conference.

16-19 - Mark Lowry traveled to La Paz, B.C., Mexico, to attend the annual Marine Mammal meeting as a representative of the SWFC Coastal Marine Mammal Program and Marine Mammal Biology Program.

19-29 - Gary Sakagawa traveled to Dakar, Senegal (Africa) and Madrid, Spain, to attend a regional group meeting for preparations of ICCAT International Skipjack Year Program Conference.

20-27 - Geoff Moser traveled to Miami, Florida, to chair editorial meetings of Ahlstrom Symposium Steering Committee at SEFC and to Boston, Massachusetts, to examine fish specimens at Museum of Comparative Zoology at Harvard University.

21-24 - Mike Laurs traveled to Washington, DC, to attend a meeting to coordinate NOAA's oceanic remote sensing efforts.

21-25 - Doug DeMaster traveled to Monterey, California, to tag sea lions at Monterey breakwaters.

- Virginia Hostler traveled to Phoenix, Arizona, to attend OPM training session on employee benefits.

- Chuck Oliver traveled to San Clemente Island, to continue studies on pinnipeds.

March 21-April 1 - A Pre-Status of Porpoise Stocks meeting was held in the small conference room.

March 23 - Izadore Barrett traveled to Tiburon, California, to attend MRF Economic Project meeting.

- Mark Lowry traveled to Ensenada, B.C., Mexico, to give lectures on current marine mammal research to students at the University.

25-26 - Izadore Barrett traveled to Monterey, California, to discuss research directions and administrative matters.

28-30 - Applicants for the NOAA Junior Fellowship Program were interviewed at the La Jolla Laboratory.

March 28-April 1 - Jim Squire traveled to Washington, DC, to represent the SWFC at the NMFS EEO/ADP Conference Workshops.

March 28-April 4 - Reuben Lasker traveled to Honolulu, Hawaii, to attend a PROBES meeting.

29 - Ben Remington traveled to Monterey, California, to discuss financial/administrative matters with Monterey staff.

29-30 - Ken Raymond traveled to Tiburon, California to explain illustrative services to Tiburon personnel, discuss printing-publication problems; take photos of Tiburon Laboratory activities.

March 31-April 1 - Izadore Barrett traveled to Tiburon, California, to discuss research directions and administrative matters with Tiburon staff.

Tiburon Laboratory

March 2-4 - Norman Abramson traveled to Dana Point, California, for a SWC Management Meeting and a joint meeting with the Southwest Region.

8-12 - Edward Ueber traveled to Coos Bay, Oregon, as an invited speaker at the Northwest Trawl Conference.

8 - Norman Abramson attended a Federal-State meeting on Catch Statistics and Sampling at La Jolla, California.

10 - Sennen Salapare met with fishermen and brokers in Ukiah, California, to discuss rock crab.

11 - Norman Abramson, Tina Echeverria, Candice Cooperrider, and Bill Lenarz attended a meeting at the Tiburon Laboratory on sampling and data processing associated with California fish landings. Other participants were from the Southwest Center, Southwest Region and California Department of Fish and Game.

15 - Maxwell Eldridge attended the San Francisco Bay and Estuarine Society Meeting.

17-18 - Maxwell Eldridge consulted with John Butler and Gail Theilacker of the SWFC-La Jolla concerning larval fish research.

23 - Edward Ueber, Susan Smith and Norman Abramson attended a meeting of the Bay Area Sport Economic Survey (BASES) at the Tiburon Laboratory. The meeting was organized and

led by Dan Huppert of the SWFC Coastal Fisheries Resources Division; non-NMFS participants were constituents associated with recreational fishing.

28-31 - Norman Abramson and William Lenarz traveled to Anchorage, Alaska, to attend the International Sablefish Symposium.

29 - Maxwell Eldridge attended an organizational meeting of the Striped Bass Working Group at University of California, Davis, California. Purpose of the meeting was to discuss upcoming research on causes for the decline of striped bass.

Pacific Environmental Group

February 27-March 4 - Gunter Seckel traveled to La Jolla, California, to attend a Center Management Meeting.

March 13-16 - Andrew Bakun traveled to Corvallis, Oregon, to attend Research Consultation on environmental variations and to identify candidates for Pacific Environmental Group oceanographer position.

VISITORS

Honolulu Laboratory

March 7-11 - Dr. John R. Hunter, Southwest Fisheries Center and Dr. James F. Kitchell, University of Wisconsin, reviewed the tuna research activities at the Kewalo Research Facility.

21 - Dr. Robert Kearney, South Pacific Commission, visited the Laboratory and participated in a joint study of short-term effects of tagging on skipjack tuna.

23 - Dr. R.G. Ackman, Technical University of Nova Scotia, Canada, met with Richard Shomura and George Balazs.

24 - Charlotte Mauldin, who was formerly with the office of Governor Coleman in American Samoa and is now a resident of Honolulu, met with Richard Shomura and Dr. Kearney.

29 - Tamaki Tavanu, Atoll Research Unit, University of the South Pacific, Tarawa, Kiribati, visited the Laboratory.

30 - M. Toriai, Japan Fisheries Company, Ltd., visited Richard Shomura and Ray Sumida.

La Jolla Laboratory

March 1 - Pete Schell, University of California, San Diego, visited Dr. Hunter.

7 - Cmdr. Bob Sandquist, Captain of NOAA research vessel Surveyor, met with Dr. Izadore Barrett and Mr. John Carr at the Laboratory.

8 - Andy Hill, SERI, Golden, Colorado.

- Norm Abramson, Tiburon, Tim Farley, California Department of Fish and Game (CDF&G), Svein Fougner, Southwest Region (SWR), Dick Heimann, CDF&G, Mel Odemar, CDF&G SWR, visited Fred Kellenberger.

21 - John Grant, California Department of Fish and Game, met with Dr. Reuben Lasker to discuss Grant's takeover as the new CalCOFI coordinator.

23 - Dr. Edward M. Donaldson, Fisheries and Oceans, Vancouver, British Columbia.

25 - Mr. Tom Maginnis, head of NOAA Policy and Planning, met with Dr. Reuben Lasker and Mr. David Mackett.

28 - Mr. William Wallace, Associate Director, Office for Civil Rights, NOAA, visited the Center.

30 - A GSA/NOAA Space Review Committee visited the Center.

Tiburon Laboratory

March 4 - Pete Granger, West Coast Fisheries Development Fdn., Portland, Oregon.

- Capt. E.L. Murdock, Rainbow Marine Assoc., Tiburon, California.

9 - Glenn D. Kiel, NMFS Inspection, SW Region, Terminal Island, California.

- Joseph Giordano, Monterey, California - (Fisherman).

- Whitey Resdernick, Morro Bay, California - (Fisherman).

11 - Dick Heimann, California Department of Fish and Game (CDF&G), Sacramento, California.

- Eric Knaggs, CDF&G, Long Beach, California.

- Connie Bonifacio, CDF&G, Long Beach, California.

- Bernice Hammer, CDF&G, Menlo Park, California.

- Tom Jow, CDF&G, Menlo Park, California.

- Phil Swartzell, CDF&G, Menlo Park, California.

- Larry Quirollo, CDF&G, Eureka, California.

14 - Svein Fougner, SW Region, Terminal Island, California.

- Jim Slawson, SW Region, Terminal Island, California.

16 - Clarence J. Weinmann, Univ. of California, Berkeley, California.

- John E. Simmons, University of California, Berkeley, California.

17 - Robert A. Swanson, San Francisco State University, San Francisco, California.

22 - J. Beuttler, United Anglers of California, Susan Hansch, California Coastal Commission, San Francisco, California, H.A. Collins, Marin Rod and Gun Club, Greenbrae, California.

23 - C. Kenneth Ruiz, Tyee Club, Tiburon, California, Paul Engler, Tyee Club, San Francisco, California.

25 - Van K. Nield, Washington Analytical Services Center, Washington, DC.

30 - Ken Raymond, NMFS, La Jolla, California.

Pacific Environmental Group

March 11 - Dr. Tom Sibley from the School of Fisheries, University of Washington, Seattle, Washington.

- Barbara Jue of GSA Self-Service Stores from San Francisco, California.

17 - Craig Barilotti from Kelco Corporation in San Diego, California.

24 - Van K. Nield from EG&G Analytical Services Center, Incorporated in Riverdale, Maryland.

- Alec MacCall from the Southwest Fisheries Center in La Jolla, California.

24-25 - Michael Glantz of the National Center for Atmospheric Research in Boulder, Colorado.

25 - Bill Gimmel of National Meteorological Center and National Weather Service in Camp Spring, Maryland.

- Dick DeRycke of the National Weather Service in Silver Spring, Maryland.

PERSONNEL ACTIONS

Honolulu Laboratory

March 1 - Alan K.H. Kam, Biological Technician (Wildlife) - Extension of Temporary Appointment.

9 - H. Sheridan Stone, Wildlife Biologist - Termination - Expiration of Appointment.

20 - Lynn M. Hondonero, Clerk Typist - Temporary Appointment Under Stay-in-School Program.

- Robert B. Moffitt, Fishery Biologist - Promotion.

- Corazon A. Myers, Computer Clerk - Temporary Part-Time Appointment.

23 - Fred R. Frizelle, III., Computer Clerk - Temporary Part-Time Appointment.

25 - James H. Prescott, Biological Technician (Fisheries) - Resignation.

28 - Doris J. Alcorn, Biological Technician (Wildlife) - Temporary Full-Time Appointment.

- Dung A. Branton, Computer Clerk - Temporary Part-Time Appointment.

La Jolla Laboratory

March 4 - Helen Hills, Computer Assistant - Resignation.

14 - Bill Sullivan, Cash and Attendance Clerk - Separation/ Transfer.

20 - Al Jackson, Biological Technician - Promotion.

- Barbara Sumida-MacCall, Fishery Biologist - Return to Duty.

27 - Brian Vorndam, Computer Assistant - Temporary Appointment.

- Lilly Tang, Computer Assistant - Temporary Appointment.

28 - Ginny Rivers, Biological Aid - Resignation.

Tiburon Laboratory

March 14 - Wendy Cole, Biological Aid, Temporary Appointment.

UNITED STATES
DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
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